TRAVELING UPSTREAM: IMPROVING WATER QUALITY OF THE MISSISSIPPI RIVER

Prepared for the McKnight Foundation

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THE HEADWATERS GROUP
Philanthropic Services℠

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INTRODUCTION

The McKnight Foundation (McKnight), based in Minneapolis, Minnesota, is among the 25 largest foundations in the United States. Established in 1953 by William L. and Maude L. McKnight, the foundation is both a responsive grantmaker that supports grassroots action and a strategic grantmaker that encourages broader system and policy reform. Since 1992, the Foundation's environment grantmaking program has grown to more than $8 million annually. Its top priorities are restoring the Mississippi River and encouraging development of clean, renewable energy sources in the Upper Midwest. On the Mississippi River (River), McKnight's overarching goals are to maintain and restore the river by directly increasing land and water protection and restoration, expanding the capacity of other organizations to do this work, and transforming systems that impede progress.

In 2004, McKnight hired Headwaters Group Philanthropic Services, LLC, (Headwaters) to research and assess water quality issues on the Mississippi River. In an iterative process that included a literature review and confidential interviews with 19 state and federal agencies and 24 nonprofits (Appendix A), Headwaters:

- Assessed water quality tracking data that could possibly be used as a tool for measuring progress in water quality efforts.
- Identified successful strategies for improving water quality or its precursor conditions.
- Identified systemic challenges to improving water quality on the mainstem of the River.
- Highlighted inter- and intra-state inconsistencies in the application of the Clean Water Act (CWA) and associated regulations.

The results of these efforts are summarized in the following findings:

1. Water quality tracking data cannot adequately measure progress.
2. The United States Environmental Protection Agency (USEPA) fails to address interstate inconsistencies and shortcomings.
3. CWA focus misses critical pollutant sources and remedies.
4. Lack of coordinated, strategic water quality focus by Mississippi River institutions.

In the ten-state river corridor, McKnight currently funds organizations addressing water quality in nine states. The administration of the Clean Water Act in those states is overseen by the USEPA Regions shown in Table 1.

Table 1. Mississippi River States Assessed by River Segment and USEPA Region

River Segment	USEPA Region	Headquarters	State
Upper Mississippi	V	Chicago, Illinois	Illinois
			Minnesota
			Wisconsin
	VII	Kansas City, Kansas	Iowa
			Missouri
Lower Mississippi	IV	Atlanta, Georgia	Kentucky
			Mississippi
			Tennessee
	VI	Dallas, Texas	Louisiana

FINDINGS

Water Quality Tracking Indicators

Quantitative data for the nine states was assessed to create a baseline using 1998 data, and, if available, 2002 data. (See Table 2.)

Table 2. Water Quality Tracking Data

1. Impaired waters – 303(d) listings
a. Number of impaired rivers or river segments
b. Number of rivers or river segments that have been de-listed (and rationale, where possible) 1998 and 2002
c. Number of rivers or river segments that advocates want listed as impaired
d. Number of rivers/segments advocates succeeded in adding to list
2. Total Maximum Daily Load (TMDL) plans
a. Number of TMDLs submitted to EPA
b. Number of TMDLs approved by EPA
c. Number of TMDLs implemented
d. Total # of TMDLs state is expected to have approved, and the deadline
3. Anti-degradation rules/policies – existence and implementation
4. Nutrient standards (y/n) and if numeric or narrative standards
5. NPDES Permits
a. Number
i. Total number
ii. Average number of permits renewed annually
b. Permit Challenges
i. Legal authority
ii. Average number of permits challenged annually
iii. Number of successful challenges – permits modified or denied
6. Monitoring and Enforcement:
a. Number of enforcement actions taken
b. Total penalties levied
c. Total collected
d. Average penalty size
e. Number of citizen suits initiated

However, in discussions with water quality policy experts and state and USEPA officials, it was determined that several of these original indicators could not be easily tracked, if at all, and others were not particularly meaningful. Consequently, the list was modified to reflect more appropriate indicators as shown in Table 3.

Table 3 has one modified and one additional tracking data point:

- **Number of Water Bodies.** For consistency among reporting categories, Headwaters elected to track the 303(d) impaired waters as water bodies rather than rivers or river segments. Water bodies include rivers, river segments, lakes, ponds, and reservoirs. While it was possible to report on river segments and lakes for 303(d) information, it was impossible to report on this same information with TMDL-related data. Specifically, TMDL data does not

distinguish between types of water bodies (e.g., river segments or lakes).

- **Impairments.** Often one river segment is impaired due to two or more pollutants; thus, the number of impairments is at least as great as the number of impaired river segments and is most often larger. Given that each pollutant requires its own TMDL, though they may be combined and submitted at the same time, understanding the number of impairments provides another measure of the task facing states, advocates, and polluters.
- **Water Body/Pollutant Combinations De-listed.** Given that TMDLs are developed around each separate pollutant, if a specific listed river segment or lake is impaired by more than one pollutant (i.e., water body pollutant combinations), then there will be a de-listing for each pollutant once a TMDL is developed and appropriately implemented. State agencies and USEPA credit one de-listing for each water body/pollutant combination, once a TMDL has been approved, and/or monitoring indicates that the pollutant of concern is no longer impairing the water body.

Table 3. Modified Water Quality Tracking Data

1. Impaired waters – 303(d) listings
a. Number of impaired water bodies
b. Number of impairments
c. Number of water bodies that have been de-listed
d. Number of water bodies that advocates want listed as impaired
e. Number of water bodies advocates succeeded in adding to list
2. Total Maximum Daily Load (TMDL) plans
a. Number of TMDLs approved by EPA
b. Total # of TMDLs state is expected to have approved, and the deadline
3. Anti-degradation rules/policies
a. Existence
b. Implementation
4. Nutrient standards
a. Existence
b. Numeric (#) or narrative (narr)
5. NPDES Permits
a. Total number
b. Average number of permits renewed annually
c. Permit Challenges
i. Legal authority
ii. Average number of permits challenged annually
iii. Number of successful challenges – permits modified or denied
6. Monitoring and Enforcement:
a. Number of citizen suits noticed and initiated

The following findings highlight the challenges with these tracking data, and identify underlying systemic issues which make their utility on a River-wide scale questionable.

Finding 1: Water Quality Tracking Data Cannot Adequately Measure Progress

The inability of the tracking data to be meaningful across state lines is due to several issues:

- State and federal funding
- 303(d) listings
- Total Maximum Daily Load plans (TMDLs)
- Anti-degradation policies
- Nutrient standards
- National Pollution Discharge Elimination System (NPDES) permits
- NPDES permit challenges
- Enforcement

State and Federal Funding

Lack of financial resources is a common theme that significantly impacts the indicators. For several years, state and federal budget deficits have seriously impacted state environmental agency budgets. In most cases, budget cuts have greatly curtailed agency water quality work. The Center for Budget and Policy Priorities reports that fiscal year (FY) 2004 state budget deficits were between $70 and $85 billion.[1] Projected deficits for FY 2005 appear to be smaller, yet remain significant – seven of the nine Mississippi River states project deficits ranging between 1 and 20 percent of their total budgets. (See Table 4.)

Table 4. Projected FY 2005 State Budget Deficits

State	FY 2005 Deficit Projections (millions of $)	Deficit as Percent of General Fund
Minnesota	185	1%
Wisconsin	0	0%
Illinois	2,000	9%
Iowa	600	13%
Missouri	600-900	7%-11%
Kentucky	200	3%
Tennessee	0	0%
Mississippi	709	20%
Louisiana	500	8%

Source: Nicholas Johnson and Zahradnik, "State Budget Deficits Projected for Fiscal Year 2005", Center on Budget and policy Priorities, http://www.cbpp.org/10-22-03sfp2.htm.

[1] Iris Lav and Johson, Nicholas, *State Budget Deficits for Fiscal Year 2004 Are Huge and Growing*, Center on Budget and policy Priorities, http://www.cbpp.org/12-23-02sfp.htm.

In its 2002 publication, "Coping with the Budget Crunch," the Environmental Council of the States (ECOS) reports that the average environmental agency budget cut was $6.5 million.[2] Many water programs were targeted for budget reductions including water monitoring and enforcement, which are already considered a serious problem (see monitoring discussion below).[3]

These budget reductions impact the ability of states to:

- Monitor adequately, process permits in a timely fashion.
- Develop and implement effective TMDLs.
- Enforce permits.

303(d) Listings

Several points about these tracking data limit the use of state 303(d) listings as indicators, including:

- **All State Coverage Rather Than Basin Specific.** The data presented covers each state in its entirety, not just the Mississippi River basin. While not as important in states fully in the Mississippi River basin, in other states such as Wisconsin and Minnesota, the numbers can be misleading.

  For example Minnesota and Wisconsin both have impaired water bodies that drain into the Great Lakes basin and not the Mississippi River basin. Unfortunately, 303(d) information includes these impaired water bodies.

- **Inadequate and Under Funded Monitoring.** State and federal agencies only know if a water body is not meeting its designated uses through monitoring data. Yet, none of the nine states monitor more than 20 percent of their streams. As demonstrated in Kentucky, the more streams monitored the greater number of streams identified as impaired. Kentucky Waterways Alliance estimated that 50 percent of the additional streams monitored between 1998 and 2002 were considered impaired.

  The USEPA interviews reflected similar concerns about the need for more monitoring. One regional EPA official noted, "Monitoring is the weak link in this whole chain. No one at the federal or state level is doing it effectively." More monitoring translates into more waters identified as impaired, which translates into more work for state agencies and advocates. Given the inadequacies of the current TMDLs in many states (see comments below),any increase in

[2] R. Steven Brown, *Coping with the Budget Crunch,* Environmental Council of the States (Winter 2002), 16-19.
[3] Ibid.

monitoring and identification of impaired waters places only more stress on over stressed public and nonprofit organizations.

- **Inadequate Sampling.** Compounding the inadequate monitoring is inadequate sampling. Regional EPA staff noted that sampling is too often restricted to pH, biological oxygen demand, and sometimes sediments. These are necessary, but insufficient parameters to determine overall ecological health of river segments or systems. As with increased monitoring, more refined and targeted sampling may identify other impairments to river segments, which in turn require further TMDLs.
- **Inconsistency Among States.** What gets listed by a state varies among states, and within states.
  - **Different Criteria.** States and EPA regions have differing criteria as to what qualifies as impaired enough to get listed and when it is appropriate for waters to be de-listed. Often for political purposes, waters are de-listed, even when they are still polluted or in need of a TMDL.
  - **Different Segments.** There is also great inconsistency among states and within states year to year as to how waters are divided into segments. A ten mile reach of a river might be considered a single segment or listing on the 1998 list, and be divided into 10 segments on the 2002 list due to changes in monitoring methods or administrative decisions.
  - **Impaired Only, Not Prevention.** Most states do not follow the law or regulations that require the inclusion of clean waters in the listing program that need TMDLs so as to prevent pollution. Therefore, only impaired waters are listed – and thus, the common misnaming of the list. Adding the need to keep pristine waters from becoming impaired is another challenge that advocates face in their work. Currently, efforts in prevention are haphazard and occur during intervention on individual permits.

TMDLs

The intended ultimate product of 303(d) listings are TMDLs. As with the listings, several issues with TMDL programs limit the utility of TMDLs as indicators or tracking data.

- **Inconsistent Quality.** Though the numbers of TMDL approvals can be (and were) obtained, many, if not most fail to meet the minimum requirements of the regulations. One regional EPA official said, "TMDLs do not lead to clean-up. There is no money for clean-up and we act on TMDLs to avoid legal action. They are meaningless." Another stated, "TMDLs are done too quickly without adequate monitoring and assessment of data. There are no reduction

strategies." Meanwhile few are challenging the TMDLs that are generated; thus, while the TMDL data are accurate, they do not reflect what is happening in terms of water quality improvements or degradations in the rivers.

- **Insufficient Implementation.** There is skepticism that full implementation of TMDLs is possible. Lack of money, political will, and citizen involvement are major obstacles to long-term water improvement.
- **TMDL Schedules.** States are expected to generate TMDLs according to federal deadlines which often may be driven by Consent Decree or other legal action. Unfortunately, most states cannot afford to implement the schedule. For example, the entire TMDL staff for the Wisconsin Department of Natural Resources (DNR) has been eliminated for FY 2005.

Anti-Degradation Policies

Most states claim to have an acceptable anti-degradation policy and implementation, but a closer review shows otherwise. For example, Tennessee has long claimed to have both, but in 2002 a state court ruled it invalid for lack of any implementation or public involvement process as required by federal regulations and subsequently forced the revocation of a NPDES permit as a result.

Nutrient Standards

Most states have some form of narrative criteria that covers nutrients. All states were required to develop numeric standards by 2003, but few have fully complied. In some states, there may be partial numeric standards, such as phosphorus for some or all lakes, but not for rivers and only narrative for nitrogen. Recently, the EPA required all states to prepare a plan for adopting nutrient water quality standards by 2008.

NPDES Permits

The USEPA Permit Compliance System (PCS) retrieval website (http://www.epa.gov/enviro/html/pcs/adhoc.html) provided information on NPDES permits. Numbers for past years are hard to get from most states, but current numbers are available from the USEPA national database. There may be variability among states in terms of data entered, and for activities for which a permit is being sought. This is especially true of minor permits, as some states permit individual home wastewater systems and swimming pool back-wash as individual permits, and others do not. This can change from year to year in a given state based on policy or the enactment of a new general permit.

NPDES Permit Challenges

Headwaters included only third party permit challenges. Most states have some form of challenge available. There are exceptions: in Missouri third party appeals provisions are being tested in the courts, in Illinois and Louisiana only the applicant can appeal a permit decision.

Enforcement

Citizen suits are an important enforcement tool and tracking indicator. As a regulatory tool (40 CFR 123.30), citizen suits allow appeals to courts for citizens without showing a particular pecuniary interest. However, there is no entity that tracks citizen suits accurately.

Water Quality Tracking Data by State

State-specific tracking data is summarized in Tables 5 and 6 (upper and lower Mississippi, respectively). Relevant issues, findings, and comments by state include:

Minnesota

- Minnesota Center for Environmental Advocacy (MCEA) has added or kept 20 impaired waters on the 303(d) listings.
- Minnesota Pollution Control Agency (MPCA) has created a multi-stakeholder process involving the agricultural community, municipalities, industry, and the environmental community to develop a comprehensive water quality assessment program, specifically focused on the TMDL process. The collaborative task force proposed to the legislature and governor a minor increase in water bills to generate adequate resources to implement TMDL. Ultimately, the governor chose not to support the initiative.
- MCEA has been working to secure nutrient standards for phosphorus.
- The cornerstone of MCEA's water protection efforts center on the NPDES permitting process. Annually, MCEA tags approximately 25 permits for scrutiny. Of these, it targets 10 permits for negotiation with the permittee and MPCA. Typically, 1-3 cases are litigated and the process can be lengthy, lasting 2-5 years.
- The governor chose not to support the initiative in 2004 and it is pending in 2005.

Wisconsin

- In Wisconsin, 33 waters were added to the 2002 303(d) list.
- Unfortunately, when asked for a schedule for TMDL completion, the Wisconsin DNR staff indicated, "We haven't produced a long-term schedule. With budget cut-backs and all of our TMDL positions being eliminated, any past schedule would be hard to meet."

Illinois

- Groups tracking data include: Environmental Law and Policy Center (ELPC), Prairie Rivers Network (PRN), and Illinois Stewardship Alliance (ISA).
- Because of the inadequacies already outlined in the 303(d) program, Illinois groups have not focused their attention on trying to prevent large number of water bodies from being de-listed. They have concentrated instead on key segments of the Fox and DuPage rivers.
- The environmental community has targeted monitoring permit renewals and requests as a tool for controlling pollution in the Mississippi River watershed. Collectively, on an annual basis, Illinois advocates respond to permits in the following ways:
  - Flag 30-40 permits (renewals or requests) for further review and analysis.
  - Identify 20 permits to receive a letter with little hope of getting modifications.
  - Send 10 notification letters to contest a permit with expectation of negotiating the permit out of court.
  - Pursue a contested case hearing with 1-2 permits per year with the objective of settling out of court, but anticipating a legal challenge that could be costly and lengthy.
- Approximately every three years, ELPC and the Sierra Club submits twenty 60-day notices for violations of the Clean Water Act, but the Attorney General (AG) typically intervenes and settles with the violator before allowing ELPC to initiate legal action.

Iowa

- The Iowa Environmental Council (IEC) has been actively involved in trying to influence the 303(d) process. Efforts include successfully influencing Iowa Department of Natural Resources 2002 303(d) listings.

Missouri

- De-listing the Mississippi and Missouri Rivers for "habitat loss" was approved by the EPA in December 2004.

Kentucky

- There was a significant increase in impaired waters between 1998 and 2002 due to increased monitoring in three of the five major watershed management units. In its 2002 303(d) report, Kentucky Division of Water asserts it will "...need to significantly increase capacity for developing TMDLs in the near future."[4] Kentucky Waterways Alliance (KWA) agrees; based on the increased amount of monitoring in the state and its own citizen monitors, KWA believes that 50 percent of all additionally monitored waters will be impaired.
- USEPA has yet to approve Kentucky's anti-degradation policy. It has taken KWA two citizen suits to force the state to act; the first to draft a USEPA-approved policy and then a second KWA lawsuit (yet to be settled) to force the state to implement it.
- KWA comments on 30-40 permit applications per year. It does not have the legal or technical wherewithal to challenge awarded permits, though it is has received technical help on one challenge from Albert Ettinger (ELPC) and a pro bono attorney from Kentucky. It would pursue many more challenges if it had the resources, targeting those that would violate USEPA's anti-degradation policy.

Tennessee

- A consent decree in 1998 forms the basis for impaired waters and TMDL work in Tennessee.
- The significant increase in water bodies impaired and impairments is due to the state redefining river segments, making more of them. Thus, comparing 1998 to 2002 data is meaningless.
- Citizens do not have the right to appeal a permit.

[4] *2002 303(d) List of Waters for Kentucky*, Natural Resources and Environmental Protection Cabinet, Kentucky Division of Water (January 2003).

Table 5. Water Quality Tracking Data for Upper Mississippi River States by USEPA Region

	Upper Mississippi River Basin									
	Region 5						Region 7			
	Minnesota		Wisconsin		Illinois		Iowa		Missouri	
	1998	2002	1998	2002	1998	2002	1998	2002	1998	2002
Impaired waters – 303(d) listings										
Number of impaired water bodies	144	1560	552	620	738	798	157	205	177	225
Number of impairments	172	N/A	942	N/A	2,863	N/A	220	251	N/A	N/A
Number of water body/pollutant combinations that have been de-listed	N/A	N/A	N/A	21	N/A	0	N/A	71	N/A	N/A
Number of water bodies that advocates want listed as impaired	N/A	145	N/A	69	N/A	Focus on 2	N/A	41	N/A	22
Number of water bodies advocates succeeded in adding to list	N/A	20	N/A	33	N/A	Focus on 2	N/A	23-25	N/A	4
Total Maximum Daily Load (TMDL) plans										
Number of TMDLs approved by EPA	0	21	0	8	N/A	9	N/A	22	N/A	37
Schedule of TMDLs	Unsure given lack of resources		None, given budget cuts		2004/05—15 2005/06—25 2006/10—27/yr 2010/13—30/yr 2013/16—32/yr 2016/17--35		2004—22 2005—19 2006—17 2007-15 – average of 20 per year		2004—8 2005—20 2006--3	
Anti-degradation rules/policies	yes, but not fully		yes, but not fully		yes, but not fully		no		No	
Nutrient standards	in process for numeric standards		Narrative		narrative		no		No	
NPDES Permits										
Total number	1,182		774		9,683		1,675		10,034	
Average number of permits renewed annually	236		155		1,937		335		2,007	
Permit Challenges										
Legal authority	Yes		Yes		Yes, but does not stop issuance of permit w/o separate action		Yes		Contested	
Average number of permits challenged annually	3 to 7		2 to 3		1		2		2	
Number of successful challenges – permits modified or denied	3		3		1		1		0	
Monitoring and Enforcement:										
Number of citizen suits noticed and initiated	0		0		2		0		1	

Table 6. Water Quality Tracking Data for Lower Mississippi River States by USEPA Region

	Lower Mississippi River Basin							
	Region 4						Region 6	
	Kentucky		Tennessee		Mississippi		Louisiana	
	1998	2002	1998	2002	1998	2002	1999	2002
Impaired waters – 303(d) listings								
Number of impaired water bodies	231	N/A	352	941	732	523	283	201
Number of impairments	367	949	796	1,610	2,259	901	1,382	443
Number of water body/pollutant combinations that have been de-listed	N/A	53	N/A	223	N/A	342	N/A	99
Number of water bodies that advocates want listed as impaired	N/A	950	N/A	18	N/A	37	N/A	32
Number of water bodies advocates succeeded in adding to list	N/A	0	N/A	5	N/A	7	N/A	14
Total Maximum Daily Load (TMDL) plans								
Number of TMDLs approved by EPA	23	37	0	65	62	125	2	376
Total # of TMDLs state is expected to have approved, and the deadline	average of 45 per year through 2011 (KY 2002 303(d) report		2004-06; 40 per year 2007- 10; 119 per year 2011—116		2004—28 2005—10 2006—62 2007—76 2008--89		2004—1 2007--84 2008—22 2009—6 2010-10 2011—48	
Anti-degradation policies	yes, but not fully		yes, but not fully		yes, but not fully		yes, but not fully	
Nutrient standards	narrative for nitrogen except in drinking water, which is numeric		narrative only, proposed numeric were turned in guide only		numeric for nitrogen in public water		narrative for nitrogen; developing numeric standards	
NPDES Permits								
Total number	7,828		1,694		5,194		8,995	
Average number of permits renewed annually	1,566		339		1,039		1,799	
Permit Challenges								
Legal authority to appeal by 3rd party	yes		yes*		yes		yes, but does not stop issuance of permit	
Average number of permits challenged annually	0	1	0	0	2	2	N/A	N/A
Number of successful challenges – permits modified or denied	0	in process	0	1	1	1	N/A	N/A
Monitoring and Enforcement:								
Number of citizen suits initiated	0	2	0	1	?	?	0	15

*Tennessee passed law in June 2005 to allow third party, citizen appeals of permits

Mississippi

- A consent decree in 1998 forms the basis for impaired waters and TMDL work in Mississippi.
- The 2002 303(d) report is yet to be approved by USEPA.
- The number of citizen suits initiated could not be determined.
- Headwaters found no organization that consistently monitors permit applications, although through Sierra Club, Earthjustice, and Gulf Restoration Network, a few permits have been challenged, half of them successfully.

Louisiana

- A consent decree in 1999 forms the basis for impaired waters and TMDL work in Louisiana.
- The 2002 303(d) report is yet to be approved by USEPA.
- There is a significant reduction in water bodies impaired and impairments between 1999 and 2002. Many of these were de-listed due to 376 approved TMDLs.
- The recent petition to remove state authority to manage the NPDES program by Tulane Environmental Law Clinic (Tulane) on behalf of Louisiana Environmental Action Network (LEAN) has lead to several USEPA mandated deadlines regarding permit application backlogs and timely and effective enforcement issues.
- LEAN and others comment on several permits, but do not challenge them.

Finding 2: USEPA Fails to Address Interstate Inconsistencies and Shortcomings

In addition to the intrastate findings identified in Finding 1, there are also glaring interstate inconsistencies in the application and interpretation of the CWA. The February 2003 petition by the Ozark Chapter of the Sierra Club to the USEPA[5] and the January 2004 report by the Upper Mississippi River Basin Association (UMRBA)[6], which validated much of the Sierra Club petition, illustrate the breadth of the problem. Highlights include:

Designated Uses

- The UMRBA report states, "The greatest apparent inconsistency among the states is perhaps with regard to drinking water use designations."[7] Wisconsin's designated uses do not include drinking water, while states down stream or across the River, do. For example, parts of Iowa and Minnesota, and all of Illinois include drinking water in the Mississippi River's designated uses.[8]
- Similarly, the River is designated for drinking water supply in Missouri and parts of Tennessee, but not in Kentucky directly upstream or across the River from these other states.[9]
- The region from St. Louis to Cairo does not include contact recreation as a designated use. The rest of the upper Mississippi River Basin, including that same stretch on the Illinois side, does include contact recreation as a designated use.[10]
- Illinois, Kentucky, Missouri, and Tennessee have designated the river for fishing use. Although Iowa shares some of the same stretch of river, it does not designate it for fishing.[11]

[5] Maxine Lipeles for Ozark Chapter of the Sierra Club, *Petition to the United States Environmental Protection Agency for Rulemaking to Protect Interstate Waters Under The Clean Water Act* (February 25, 2003).
[6] Upper Mississippi River Basin Association, *Upper Mississippi Water River Quality: The States' Approaches to Clean Water Act Monitoring, Assessment, and Impairment Decisions* (January 2004), 33.
[7] Ibid., 33.
[8] Ibid.
[9] Lipeles, *Petition to USEPA*.
[10] Upper Mississippi River Basin Association, *Upper Mississippi River Water Quality*.
[11] Lipeles, *Petition to USEPA*.

Criteria for Determining Whether Designated Use is Supported

- In assessing drinking water use, Illinois tests for atrazine and nitrates, Iowa looks at an array of toxic pollutants as well as nitrates, and Missouri looks at nitrates, toxics, iron, manganese, and total dissolved solids.
- For aquatic life use, Illinois, Iowa, Minnesota, and Missouri have numeric thresholds for cases of chronically exceeding conventional and toxic pollutants. Wisconsin uses best professional judgment.[12] Wisconsin was the only upper Mississippi River state to determine that more than 50 percent of its River miles fully supported aquatic life.[13]

Monitoring and Assessment

- There are 11 water-monitoring stations on the Illinois side of the Mississippi River and none on the Missouri or Iowa side.[14]
- States do not use all available data sources in assessing water quality and designated uses (Table 7).

Table 7. State's Use of Outside Data Sources for the Upper Mississippi River 2002 Assessments and Listings

	Other State's Data		USGS Long Term Resource Monitoring Program (LTRMP)		USGA National Stream Quality Accounting Network (NASQAN)	
	Review Data	Utilize Data	Review Data	Utilize Data	Review Data	Utilize Data
Minnesota	Yes	No	Yes	Yes	NA	NA
Wisconsin	Yes	Yes	Yes	Yes	NA	NA
Illinois	No	No	Yes	No	Yes	No
Iowa	Yes	Yes	No	No	Yes	Yes
Missouri	No	No	No	No	Yes	Yes

NA = Not Applicable. There are no NASQAN sites on the Upper Mississippi River (UMR) in Minnesota or Wisconsin.

Review Data = In preparing 305(b) assessments and 303(d) listings for the UMR, did the state review data from this outside source?

Utilize Data = Did this outside data source form any part of the basis for the state's 2002 impairment decision on the UMR?

Source: Upper Mississippi River Basin Association, *Upper Mississippi River Quality: The States' Approaches to Clean Water Act Monitoring, Assessment, and Impairment Decisions* (January 2004).

[12] Upper Mississippi River Basin Association, *Upper Mississippi River Water Quality*.
[13] Ibid., 35.
[14] Personal interview.

Water Quality Standards and Criteria

- Criterion for mercury varies from 0.44 to 4.0 μg/L across the upper Mississippi River basin states.[15]
- None of the upper Mississippi River basin states have set numeric water quality standards for phosphorus in rivers.[16,17]
- Although Missouri is directly downstream from Iowa, its criteria for Polychlorinated Biphenyls (PCBs) is 10 times lower than Iowa's.[18]
- Most states have a narrative standard for nutrients and many have a numeric nitrate standard for segments of water that are designated for dinking water use. However, as noted in the UMRBA report, "Narrative criteria do not generally provide as clear and defensible basis for state impairment decisions as numeric criteria."[19]
- No states have developed biocriteria for the Mississippi River, yet several have aquatic life as a designated use.
- Most states do not have numeric indicators for sediment or turbidity despite their being the cause of impairment in several states (Table 8). The Upper Mississippi River Conservation Committee has recommended numeric water quality criteria for total suspended sediments of 25 mg/L for "…the Mississippi River as well as tributary streams discharging into reaches where SAV [submerged aquatic vegetation] development and protection have been identified as important management objectives and goals." [20]
- Unlike some other significant bodies of water, such as the Great Lakes or the Chesapeake Bay, there are no standard water quality policies that all mainstem River states follow in managing the Mississippi River in their states. For example:
  - All Great Lakes states must comply with the Great Lakes Water Quality Guidance issued by USEPA in 1995. The guidance includes criteria for states to use when setting water quality standards for 29 pollutants being discharged into the Great Lakes, including bioaccumulative chemicals of concern. It also prohibits the use of mixing zones for these toxic chemicals.[21]

[15] Upper Mississippi River Basin Association, *Upper Mississippi River Water Quality*.
[16] Ibid.
[17] Lipeles, *Petition to USEPA.*
[18] Ibid.
[19] Personal Interview.
[20] Upper Mississippi River Conservation Committee Water Quality Technical Section, *Proposed Water Quality Criteria Necessary to Sustain Submersed Aquatic Vegetation in the Upper Mississippi River* (October 2003).
[21] USEPA, *Great Lakes Initiative*, http://www.epa.gov/waterscience/GLI/.

  - Chesapeake Bay states have agreed upon sediment and nutrient reduction goals by sub-basins and establishment of water quality criteria for dissolved oxygen, chlorophyll a, and water clarity.[22]

- NPDES permits are regulatory tools that are supposed to prevent violations of all downstream water quality standards including those of other states. For example, Illinois should be writing permits to prevent violations of Missouri standards. Though this tool is available to all states, it is not used to its fullest advantage.

Finding 3: CWA Focus Misses Critical Pollutant Sources and Remedies

The key water quality issues facing the mainstem of the River are **sediments and nutrients**:

- Of the range of pollutants causing impairments on the mainstem of the Mississippi River (Table 8), sediments and nutrients are the two believed by most to: 1) occur throughout the mainstem of the River; and 2) contribute the most to degradation of the ecological health of the River.[23,24,25]

- Though nutrients are clearly recognized as a cause of impairments in the tributaries of the upper Mississippi River and in the Gulf of Mexico, they are also ubiquitous in the mainstem of the River, and their contribution to eutrophication in backwaters of the mainstem is well documented.

- Most of the other impairment-causing pollutants are:
  - Localized (e.g., zinc and lead problems in the Missouri reach); thus, not a systemic, river-wide issue.
  - Due to atmospheric deposition (i.e., mercury, and, to some extent, dioxin); thus, not easily addressed by the CWA or other water-related statutes.
  - The residual of now-banned chemicals remaining in the system (e.g. PCBs); thus, not easily addressed by the CWA or other water-related statutes.

- The vast majority of funding directed at these non-point sources (Farm Bill Conservation Title funds) are not directed strategically. That is, they are not focused on the watersheds or geographic areas where substantial non-point source problems affecting the River

[22] Chesapeake Bay Program, *Backgrounder*, http://www.chesapeakebay.net.
[23] Ibid.
[24] United States Geological Survey, *Nutrients in the Upper Mississippi River: Scientific Information to Support management Decisions, USGS Fact Sheet 105-03* (July 2003).
[25] Personal communications with several of the interviewees.

> arise.[26] Especially with the conservation title funds, the higher priority is equitable distribution across a state, not water quality or other ecological needs. This is often frustrating to state water quality officials. One state official noted, "The United States Department of Agriculture spends roughly $3 billion a year in our state on farmer programs yet the nitrate concentration in our rivers continues to rise."[27]

The USEPA and state water pollution agencies have some say over these pollutants. Standards can be set, permits issued and enforced, monitoring points established, data collected routinely, and impairments caused by them recorded. All those actions need to be completed. However, given that a primary source of these two pollutants – agricultural runoff from farm fields – is not regulated by the CWA, other venues must be pursued in addition to CWA and state water quality agencies addressing them.[28,29]

[26] Personal communications with several of the interviewees.
[27] Personal interview.
[28] National Science and Technology Council's Committee on Environment and Natural Resources, *Hypoxia in the Northern Gulf of Mexico: An Integrated Assessment* (May 2000).
[29] Upper Mississippi River Basin Association, *Upper Mississippi River Water Quality*.

Table 8. List of Impaired Segments of the Mississippi River by State and Responsible Pollutant

State	Areas Listed as Impaired	Pollutants Causing Impairments (may vary by reach)
Minnesota	◆ Entire river	Ammonia Fecal coliform Mercury Nutrients PCBs Turbidity
Wisconsin	◆ Entire river	Mercury PCBs
Illinois	◆ Entire river	Flow alteration Habitat alteration Metals Nitrates Nutrients Organic enrichment Pathogens PCBs Phosphorus Priority organics Siltation Suspended solids Total Ammonia-N
Iowa[30]	◆ Pool 15; ◆ Wapsipinicon River to Clinton; ◆ Missouri state line to Ft. Madison	Arsenic Organic enrichment
Missouri	◆ Entire river	Habitat alteration Lead Zinc
Kentucky	◆ None	
Tennessee	◆ Entire river	Dioxin PCBs Pesticides Siltation
Mississippi	◆ Tennessee state line to HUC boundary; ◆ Lake Beulah to Vicksburg; ◆ And Vicksburg to Warren Claiborne County Line;	Mercury Nutrients Organic enrichment Pathogens Pesticides Siltation
Louisiana	◆ From old river control structure to head of passes	Mercury Pesticides Priority organics Siltation

Sources: Upper Mississippi River Basin Association, *Upper Mississippi River Quality: The States' Approaches to Clean Water Act Monitoring, Assessment, and Impairment Decisions* (January 2004).

United States Environmental Protection Agency, *National Section 303(d) List Fact Sheet*, http://oaspub.epa.gov/waters/national_rept.control.

[30] The UMRBA report notes on page 52, "Iowa explains it did not list the upper Mississippi River for suspended sediment, sedimentation, or turbidity, because the problems associated with those parameters do not constitute violation of numeric or narrative criteria water quality standards."

Finding 4: Lack of Coordinated, Strategic Water Quality Focus by Mississippi River Institutions

Whether the institutions are government agencies (state, regional, or federal) or non-governmental organizations (NGOs), there are no known coordinated, strategic efforts that prioritize water quality and ecological protection for the entire River.

Government Agencies

Current government agency efforts are pollutant or biologically-specific focused or targeted to a specific geographic region (Table 9). No agency or collection of agencies focuses on improving the overall ecological health of the River.

These agency efforts are not to be discounted. Each may be doing an excellent job within its sphere of responsibilities or expertise; however, the lack of a systemic, holistic view of the River and its priority needs reduces the potential River-wide impact of these disparate efforts. Resources are not channeled to tackle those issues that will yield the greatest gains in ecological health and water quality improvements.

Nonprofit Groups

Most nonprofit organizations involved in this project operate at the state or local level. Their work on water quality issues *statewide* is critical. Also, many have been successful using a combination of targeted and opportunistic legal strategies, precedent- setting challenges to specific NPDES permits, selective enforcement activities, and outreach to concerned citizens and regulatory agencies.

For the most part, these efforts are targeted statewide; none of these groups has a specific River initiative or campaign. Moreover, they are not collectively targeting the two significant river-wide pollutants – sediments and nutrients.

For those nonprofits operating at regional or national scales, Mississippi River quality is but a part of their strategies within a larger mission and/or geographic scope. These organizations focus on separate and related, yet not always coordinated, issues.

Table 9. State and Federal Agencies with Environmental-Related Responsibilities on Mississippi River

Federal Agencies	Focus/Responsibility/Mission
EPA Regions IV, V, VI, and VII	There are four USEPA regional offices with oversight responsibilities for one or more of the 10 states along the mainstem of the Mississippi River. They are responsible for implementation of the Clean Water Act.
United States Department of Agriculture's Natural Resources Conservation Services (NRCS)	NRCS and its state representatives received $749 million in FY2002 and $4.9 billion from FY1995-2002 in conservation funds in the 10 mainstem states, much of which is directed at reducing run-off into rivers and streams.[31]
U.S. Army Corps of Engineers (Corps)	The Corps is responsible for managing the River's lock and dam system; maintaining the levies, a nine-foot navigation channel, and backwater areas; and maintaining and restoring the River's bordering riparian habitat. It spends around $150 million per year on operations and maintenance of the upper River. Its Environmental Management Program (EMP) averaged $16.9 billion between FY1994-2004.
Mississippi River/Gulf of Mexico Watershed Nutrient Task Force	Created by the USEPA, the task force was charged with creating an action plan for reducing, mitigating, and controlling hypoxia in the northern Gulf of Mexico.
Regional Groups	
United States Geological Survey's Long Term Monitoring and Research Program (LTMRP)	The mission of the LTRMP is to provide decision makers with the information needed to maintain the upper Mississippi River system as a viable multiple-use large river ecosystem. The long-term goals of the LTMRP are to understand the system, determine resource trends and impacts, develop management alternatives, manage information, and develop useful products.
Upper Mississippi River Conservation Committee (UMRCC)	The committee's objectives are: to promote the preservation and wise utilization of the natural and recreational resources of the upper Mississippi River; to formulate policies, plans, and programs for carrying on cooperative surveys and studies; to keep necessary records, publish, and distribute reports; and to make recommendations to the governing state bodies in the furtherance of the objectives of the UMRCC.
Upper Mississippi River Basin Association (UMRBA)	A regional, interstate organization formed by the Governors of Illinois, Iowa, Minnesota, Missouri, and Wisconsin to help coordinate the states' river-related programs and policies and work with federal agencies that have river responsibilities. Their purpose is to facilitate dialogue and cooperative action regarding water and related land resource issues.
Ohio River Valley Water Sanitation Commission (ORSANCO)	ORSANCO operates programs to improve water quality in the Ohio River and its tributaries, including: setting waste water discharge standards; performing biological assessments; monitoring for the chemical and physical properties of the waterways; and conducting special surveys and studies.
Upper Mississippi River Basin Task Force	Made up of congressional members, the task force disseminates information and coordinates legislative efforts on areas of agreement for the benefit of the upper Mississippi River.
Lower Mississippi River Conservation Committee (LMRCC)	A cooperative, nonprofit organization of state and federal agencies formed to address the challenges of renewing and effectively managing the natural resources of the lower Mississippi River. Their work includes cooperative efforts involving planning, management, information sharing, public education, advocacy, and research.
State Agencies	
State Water Quality Agencies	State-level water quality-related responsibilities -- issuing permits, monitoring, and enforcing compliance -- primarily reside in states' environmental departments; however, agriculture may also have responsibilities for agriculture-related water quality issues.

[31] Environmental Working Group (EWG), *EWG Farm Subsidy Data Base*, http://www.ewg.org/farm/progdetail.php?fips=19000&yr=2002&progcode=totalcons&page=states.

RECOMMENDATIONS

Critical challenges to improving water quality in the River include:

- Lack of and inconsistent regulatory controls.
- Lack of strategic coordination and targeting of non-point source management resources combined with equally dispersed ecological protection and restoration activities in the riparian corridor of the River.

Recommendation 1: Clean Water Coordination and Enforcement

To address the issue of inconsistent regulatory controls, Headwaters recommends the following specific outcomes:

1. **Coordinated Mississippi River states' water quality effort** for the entire River that includes establishment and implementation of:
    a. Standardized numeric water quality standards for all pollutants causing impairments in any one of the states including nutrients and sediments.
    b. Standardized use designations including criteria for determining use and use impairment.
    c. Uniform permitting (NPDES and 404), monitoring, compliance, and enforcement policies and procedures.

Coordination could occur through one or more of the following:

    a. Establishment of an interstate commission similar to the Ohio River Valley Water Sanitation Commission or Delaware Bay Commission authorized to carry out the functions necessary to meet this outcome.
    b. A Great Lakes Initiative-like (GLI) effort statutorily-based, mandating states (instead of an interstate commission) to comply with a set of USEPA-developed water quality criteria for a set of targeted pollutants. One state water quality official claimed, "We need a GLI-like or Everglades-level effort on the River. States are just too overwhelmed with their other responsibilities to give the River its due."[32]
    c. Working with the UMRBA, Upper Mississippi River Conservation Committee (UMRCC), and Lower Mississippi River Conservation Committee (LMRCC) to compel their state and federal members to establish formal, binding agreements that will

[32] Personal interview.

ensure this outcome. This may include an organized effort by these organizations, their state members, and advocates to obtain additional federal funds for this effort. UMRBA is already discussing these ideas; it should be the focus of more River groups' advocacy and support.

2. **Adequate TMDLs have been developed for impaired waters on the Mississippi and resources identified to implement.** Currently, this is the only mechanism for addressing multiple sources and multi-jurisdictional pollutants. Achieving this outcome would require substantial state level work to ensure the resources and political will to ensure success.

Recommendation 2: Sediment and Nutrient Reduction Campaign

With sediments and nutrients the most pervasive system wide pollutants, logic suggests they be targeted. To date, the efforts to control these mostly non-point sourced pollutants have not been strategically targeted to the mainstem of the River, its critical major tributaries, or even to the key states on the mainstem that contribute significant amounts of these pollutants into the River.[33]

Specific outcomes could include:

1. State and federal agencies are adequately funding, implementing, and monitoring progress of the **Action Plan** for Reducing, Mitigating and Controlling Hypoxia in the Northern Gulf of Mexico.

   Though short of mandating interstate and interagency cooperation, the Action Plan is the best (and only) River wide plan that has been published, vetted, and is actively discussed and pursued, albeit at very slow pace.

2. The **state conservationists** in the mainstem Mississippi River are working consistently with the state water quality agencies to identify, target, and put resources into watersheds contributing significant nutrient and sediments loadings to the mainstem of the Mississippi River.

3. **The Corps is targeting its Environmental Management Program** to capture and reduce nutrients and sediments in coordination with state water quality agencies and State Conservationists.

[33] The system-wide focus or intent to focus on nutrients contributing to the dead zone is the closest to a strategic effort. While important, it still remains under funded and is at least two years behind its timeline. Furthermore, it addresses only one of the two pollutants.

4. **A full environmental assessment of the lower Mississippi River has been completed** per section 402 of the Water Resources Development Act.
5. **The Corps is fully covering environmental restoration and protection costs for the 2.8 million acres of Lower Mississippi River floodplain**.

CONCLUSION

The McKnight Foundation originally requested that Headwaters help identify and assess quantitative indicators of water quality trends on the River. Headwaters has documented deeper systemic issues due to the ways in which the water quality laws are being implemented, lacking coordination among states and associated implementing agencies. These systemic issues render simple water quality indicators inadequate and even misleading for determining the true health of the River. Furthermore, Headwaters identified the need for more focus on ubiquitous water quality issues such as sedimentation and nutrients.

As a result of this report, The McKnight Foundation:

1) Has awarded a grant to the National Academy of Sciences to examine implementation of the Clean Water Act on the Mississippi River.

2) Is taking steps to strengthen the capacity of a subset of grantees focused on water quality improvement and to enable them to collaborate effectively.

APPENDIX A
LIST OF INTERVIEWEES

Government Agencies

ILLINOIS
Environmental Protection Agency
Toby Frezert
Gregg Good
Bob Mosher

IOWA
Department of Natural Resources
Chuck Corell
John Olson

KENTUCKY

LOUISIANA
Natural Resource Conservation Service
Don Gohmert

MINNESOTA
Natural Resource Conservation Service
Sid Cornelius
Tim Koehler

Pollution Control Agency
Jim Hodgson
Tim Larson
Charles Regan
Jeff Risberg
Norman Senjem

MISSISSIPPI
Natural Resource Conservation Service
Al Garner

MISSOURI
Natural Resource Conservation Service
Bob Ball

TENNESSEE
Division of Water Pollution Control
Paul Davis

Natural Resource Conservation Service
Donald Dotson
James Ford

WISCONSIN
Department of Natural Resources
Todd Ambs

Natural Resource Conservation Service
Don Baloun

REGIONAL
Environmental Protection Agency - Region 4
Bill Cox
Jim Giattina
Mark Nuhfer

Environmental Protection Agency - Region 5
Bill Franz

Environmental Protection Agency - Region 7
Larry Shepard

Lower Mississippi River Conservation Committee
Ron Nassar, US Fish and Wildlife Service

Ohio River Valley Water Sanitation Commission
Peter Tennant

United State Geological Services
Robert Delaney

Upper Mississippi Environmental Science Center
Leslie Holland-Bartels

Upper Mississippi River Basin Association
Barb Naramore

Nonprofit Organizations

ILLINOIS

Illinois Stewardship Alliance
Mark Beorkrem

Prairie Rivers Network
Jean Flemma

IOWA

Iowa Environmental Council
Susan Heathcote

KENTUCKY

Kentucky Waterways Alliance
Judy Peterson

LOUISIANA

Louisiana Environmental Action Network
MaryLee Orr

Tulane Environmental Law Clinic
Adam Babich

MINNESOTA

Minnesota Center for Environmental Advocacy
Kris Sigford

MISSISSIPPI

MISSOURI

Missouri Coalition for the Environment
Ted Heisel

Washington University Interdisciplinary Environmental Clinic
Maxine Lipeles

TENNESSEE

Tennessee Public Employees for Environmental Responsibility
Barry Sulkin

Tennessee Clean Water Network
Renee Hoyos
Kim Rondsom

WISCONSIN

Midwest Environmental Advocates
Melissa Scanlan

REGIONAL

American Rivers
Betsy Ott
Melissa Samet

Clean Water Network
Eddie Sher

Environmental Defense
Scott Faber

Environmental Law and Policy Center
Albert Ettinger

Gulf Restoration Network
Cynthia Sartou

Institute for Agriculture and Trade Policy
Mark Muller

Mississippi River Basin Alliance
Doug Daigle

Natural Resources Defense Council
Nancy Stoner

Northeast Midwest Institute
Allen Hance

River Network
Gayle Killam

Soil and Water Conservation Society
Craig Cox

World Resources Institute
Suzie Greenhaulgh

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